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A special report
by John Howser



RING OF FIRE

Methamphetamine's toll hits users, families, communities—and medical centers



BY JOHN HOWSER

The first thing a visitor might notice is the bright red and yellow child's drawing taped to the door.

The second thing is that the woman in the bed looks like somebody turned a blowtorch on her face.

Her swollen face is held together with strips of carefully placed sterile surgical tape, forming a criss-cross pattern leaving only her eyes, a small portion of each cheek, and her lips exposed. She lies motionless in her intensive care bed in Vanderbilt's Regional Burn Center. As her care goes on quietly around her the woman exists in a semi-conscious state.

Within this admittedly terrible context, the woman in the bed could even be said to be lucky. Jeff Guy, M.D., associate professor of Surgery in the Division of Trauma and Surgical Critical Care and director of Vanderbilt's Regional Burn Center, has certainly seen worse.

The woman was cooking a batch of methamphetamine when her home chemistry experiment went horribly awry. This patient, Guy says, will have scars for the rest of her life, but she will live.

Will she regain some balance in her life, manage to live without the addictive drug whose effects have put her here? What about the future of the nameless child whose artwork of a stick figure standing under a bright sun is the only personal adornment in the room? The questions hang in the air without answers, as the Burn Center staff does their best to return the woman to health.

Unfortunately, the woman in the Burn Center ICU is not unusual.

In the past few years, VUMC has seen an influx of patients who are burned cooking meth, and the effects ripple out far beyond just those patients. Meth users and those who manufacture the drug in a thousand home laboratories are ravaged by the drug, of course, but there are also the innocent victims of meth: children whose parents lose themselves in the labyrinth of its addiction; families who are torn apart by its ravages; others who have their lives shattered by the criminal activity of meth users or by meth users driving while intoxicated; and, finally, the taxpayers and health care consumers who ultimately pick up much of the tab for treating injured drug addicts who virtually never have health coverage and whose bills can easily run into the hundreds of thousands of dollars.

“Real big”

Tennessee is well known for its country music, the Great Smoky Mountains and Elvis, but in the last few years Tennessee has received another distinction—it is one of the top five states for methamphetamine lab seizures. And where meth is being made, officials say, it’s also being used in abundance. Certainly, meth has been around for decades, but in the last few years doctors, nurses and counselors at Vanderbilt University Medical Center have begun to see the effects of meth on Middle Tennessee.

According to the U.S. Drug Enforcement Administration’s (DEA) Clandestine Lab Seizure System (CLSS), which is a database of local state and federal records centrally collected to document clandestine drug lab seizures, and according to the Tennessee Governor’s Meth Task Force, there were 1,574

meth lab seizures in Tennessee in 2004. This places Tennessee second only to Missouri in meth lab seizures across the United States for that year. In 2005, there were 897 meth lab seizures through August according to the FDA’s most recent data. Tennessee is listed among the top five states for meth. Only Washington, California, Texas and Kansas rank higher.

Donna Seger, M.D., Vanderbilt’s chief clinical toxicologist and director of the Tennessee Poison Center, puts the numbers into words: When asked to describe the level of the meth problem in Tennessee, she uses two syllables: “Real big.”

In her role as director of the Tennessee Poison Center, Seger oversees a state and federally-funded telephone triage system of trained poison information specialists. Also in this role she makes frequent trips out into Tennessee communities speaking to groups about the state’s meth problem.

Seger says meth use in Tennessee is even larger than it may seem because most users do not wind up hospitalized. “There are many more people who use meth than we see who are sick from it,” she said.

An exact number of patients brought through the doors of VUMC from meth-related illness or injury—or a running tab on the cost of treating these patients—cannot be tallied. VUMC, like virtually all hospitals, performs toxicology screening only on patients in which that information is relevant to treatment protocols. Most of the institution’s hospital and clinic visits for meth-related illnesses go undocumented as such.

What can be quantified at this point is that VUMC has provided millions of dollars in uncompensated critical care—sur-

Donna Seger, M.D.



geons, nurses, intensive care unit bed space, therapists, social workers and medications for victims of meth-related explosions and fires. Typically, by the time these patients wind up at VUMC they have lost virtually everything, including medical insurance, leaving the institution to foot the bill for care in a majority of cases.

Seger recalls one former patient, a man in his early 20s, who shared with her that he'd been using meth since age 13. The man's father was a meth cook who started his son out dealing for him at a young age. He was around the drug all the time, so naturally he started using. Seger met this man when she was called upon to perform a medical competency evaluation to see if he was fit enough to enter jail.

"He was high for several days in a row, on a meth run. So he and a friend kidnapped some people and held them at gunpoint for two days while they were high like that," she said. "With chronic meth use you really do lose rational thought."

The Drug Abuse Warning Network (DAWN) reports that methamphetamine-related admissions to the nation's emergency departments have been steadily on the rise since 1995. DAWN reports there were 17,696 emergency department admissions nationwide in 2002 that were recorded as meth-related.

"When we see meth patients in the Emergency Department it is often heartbreaking," said Corey Slovis, M.D., chairman of the Department of Emergency Medicine at Vanderbilt.

"We see broken down young adults who look much older than their stated years. They often have really bad teeth due to a condition we refer to as 'meth mouth.' We see patients looking to detox again and again when they run out of options. This is a drug of abuse that one cannot really say anything other than 'what a waste to the person, the community, and our society'."

High Behind the Wheel

For Tim and Twila Hurst, the world was looking up. Tim had just accepted a new job as editor of the *Glasgow Daily Times* in Glasgow, Ky., and the couple was in the process of looking for a house so they could relocate from Indiana.

In the course of the house hunt, Twila was riding with Glasgow real estate agent Sybil Leamon, who was driving a GMC Jimmy. The women pulled away from a rural intersection on Highway 31 East on Friday, Aug. 20, 2004.

Twila Hurst's memory is blank until about four weeks later.

What others have told her is this: The vehicle in which she and Leamon were traveling was smashed head-on at high speed by a 19-year-old man high on methamphetamine. The teenager lost control while behind the wheel of his full-size



Ford F-250 pickup truck, sending the vehicle across the highway's center line and head-on into the front of the vehicle with the two women.

Sybil Leamon was killed instantly. Twila Hurst was badly injured.

The 19-year-old boy who caused the accident and an 18-year-old passenger also in his truck were not hurt.

The vehicle in which she and Leamon were traveling was **SMASHED** head-on at high speed by a 19-year-old man **HIGH ON METHAMPHETAMINE**. The teenager **LOST CONTROL** while behind the wheel of his full-size Ford F-250 pickup truck.



Chris Greely, M.D.

Twila and Tim credit her survival to a fortunate series of events that quickly brought emergency medical personnel to the accident scene — assistance from the staff of the community hospital in Glasgow, and then the quick response of the crew of Vanderbilt's LifeFlight air ambulance.

"My head was cut from about the middle at the top, and the cut went almost completely halfway around my scalp," Twila said. "The left side of my pelvis was shattered. My right wrist was fractured. My right thumb was fractured. My right femur was shattered into two pieces. My right ankle was fractured, and my left arm was broken."

Hurst spent 10 days in Vanderbilt University Medical Center's Trauma Unit as surgeons worked to piece her broken body back together. Her recovery was followed by weeks in a physical rehabilitation facility back home in Kentucky.

Tim Hurst says his wife would likely not have survived the accident if the SUV in which she was traveling had not had a sunroof.

"Twila's severe scalp laceration came from her head shattering the sunroof. However, the paramedic on the scene said that if the vehicle had a metal roof instead, Twila's neck probably would have been snapped in two during the wreck," he said.

Fortunately, after months of recovery and rehabilitation, and more than \$400,000 in medical expenses, Hurst has made a remarkable physical recovery. Today her lingering physical

effects are a limp from where her pelvis and leg bones were screwed back together, and a few less-obvious physical limitations. However her effort to remember the accident and the several weeks immediately afterward has proven futile.

"I know it would be all bad memories. But to have bad memories would be better than no memory at all," Twila said.

The young driver of the pickup pled guilty, receiving an eight-year sentence for manslaughter in the second degree and assault in the second degree. The Hursts believe this sentence isn't nearly enough.

"Our nightmare lasted months. Twila spent 10 days in the Trauma Center and another 11 weeks in a nursing rehabilitation facility, because she could not use either of her legs or her right arm due to the extent of her injuries," Tim said.

Tim says that while his new boss was accepting and supportive during Twila's hospitalization, the ordeal was too much for the couple—physically, emotionally and financially. The exciting new job didn't work out. After 16 months, Tim resigned from the paper.

"During my exit interview my boss said 'I just don't know what happened to the man I hired.' I knew. Meth happened," he said. "I didn't take it. My wife didn't take it. We knew little about it. But because a young man from Glasgow thought it was a good idea to take meth and get behind the wheel of his truck, meth changed our lives forever."

Toxic Chemicals, Toxic Parents

As the pediatrician in charge of child abuse diagnosis for the Monroe Carell Jr. Children's Hospital at Vanderbilt, Chris Greeley, M.D., assistant professor of Pediatrics and medical director of the Child Maltreatment Program, sees the handiwork of the worst of human behavior on a routine basis. Almost every day he has to look into the eyes of children who are victims of willful neglect or assault by those who are charged with providing love and care. Greeley has undergone specialized training to teach him how to seek out not only the obvious, but also very subtle signs and symptoms of abuse in children.

Almost since his arrival as a faculty member at Vanderbilt, Greeley began to see children who are directly exposed to methamphetamine by parents who are meth users or cooks, or babies who suffered indirect exposure due to the mother's drug use during pregnancy.

"Here at Vanderbilt the smaller of these two groups are the children who are exposed to meth after they are born," he said. Greeley refers to these victims as having suffered "incidental" exposure to meth. "This is a small, but quite significant population who come in with postnatal exposure," he said.

Greeley says what is typically seen with these children is they are exposed to meth and other drugs in their living environments. "It's not just the meth itself, but the environment in general that's harmful," he said.

These children are exposed not only to meth—the finished product—but also the toxic solvents and chemicals, such as chlorine, phosphorus and other fertilizer-caliber materials necessary to manufacture the drug.

According to the Office of National Drug Control Policy (ONDCP), typical production of one pound of meth results in five to seven pounds of toxic waste.

While recipes for making meth can vary by ingredients, much like a family's secret recipe for spaghetti sauce, many of the essential and highly-toxic base chemicals are the same.

Currently, when children are discovered by law enforcement in a dwelling used for cooking meth there is no standard evacuation protocol. As if it weren't bad enough for the child's parents to put them in this environment, frequently when a lab is discovered and children are present, well-meaning law enforcement personnel may add further emotional trauma by taking a child outside into the yard, stripping them of all clothing and then hosing them down. Seger says this behavior is excessive in many instances.

"When we look at a child exposed to meth manufacturing we know what he's been exposed to in terms of broad categories of chemicals," Seger said. "The immediate reaction by some people is to want to do everything to the child and that's usually unnecessary."

The other damning factor for children living in a meth-filled environment is exposure to their parents' erratic behavior.

"Living with parents who are meth addicts exposes children to needles around the house, booby-trapped houses, and guns lying around. The parents themselves have such poor health that neglect becomes a big issue," Greeley said. "Especially when they are high, and subsequently when they crash, parents are not providing nutrition or hygiene. So this has two major insults on the child."

A short history of meth: Akira Ogata, Lazar Edeleanu, Adolph Hitler

Methamphetamine was first synthesized in 1919 by Japanese chemist Akira Ogata. Methamphetamine is a derivative of amphetamine, which was first synthesized in 1887 by Romanian chemist Lazar Edeleanu.

Ogata was able to purify and distill a more powerful form of amphetamine, methamphetamine, simply by the reduction of ephedrine and other commonly available chemicals. Today's street chemists find that recipes for meth are readily available, are cheap, use highly toxic ingredients, and are unfortunately extremely easy to duplicate with appropriate access to key ingredients.

Methamphetamine's history was checkered from the very start. The drug was widely distributed during World War II by Nazi Germany to its soldiers as a form of stimulant, and was used heavily by Nazi SS personnel. History notes that Adolph Hitler received daily injections of methamphetamine throughout the war from his personal physician Theodore Morrell.

After World War II methamphetamine moved into commercial use during the 1950s as a prescription drug, sold under the name Pervitin, which was prescribed for narcolepsy, alcoholism, depression, Parkinson's disease and as an obesity treatment. Prescriptions for methamphetamine reached a peak of 31 million in the United States in 1967.

Illegal manufacturing of meth in the United States started in Southern California in the early 1960s as a cheap, easily synthesized, highly effective and highly addictive stimulant. It is now a common scourge of rural American life.

Why in the country? The manufacturing of meth is typically carried out in rural areas due to telltale signs which would give away the drug's production in more densely populated areas. Also, the paranoid behavior brought on by meth use, which is uniform among meth cooks and users, brought the need for social distancing.

According to the Office of National Drug Control Policy (ONDCP) legally manufactured methamphetamine is a Schedule II drug under the Controlled Substance Act of 1970, which means it has a high potential for abuse, is currently accepted for medical use in treatment in the United States, and its use may lead to severe psychological or physical dependence.

It should be noted that virtually all methamphetamine abused in the United States today is illegally manufactured, either in small, portable, clandestine labs, like those typical in Tennessee which can produce a few ounces or maybe a pound at one "cook," or in large illegal production facilities in Mexico, some of which can produce over 10 pounds of the drug each day.

More frequently than young children and preteens, Greeley sees the end result of babies who are exposed to meth and other illicit drugs during gestation, a transposing of the exposure to meth into the prenatal environment of the womb during pregnancy.

“Pregnant women who are drug users, specifically meth users, have significant problems in and of themselves with their own health from doing drugs, or trading sex for drugs, which often leads to sexually-transmitted diseases,” he said. “Then the baby, much like during postnatal exposure, is living in an environment inside the mother where they are exposed to drugs, and the shrapnel from the mother’s lifestyle, which is poor nutrition, infections and perhaps even trauma.”

Babies born from an *in utero* meth environment can be born into withdrawal symptoms. Greeley says these symptoms can range from very subtle, such as being jittery or sensitive to light, to pronounced symptoms such as seizures which may require tube feeding until withdrawal symptoms pass. Other telltale signs of exposure to meth *in utero* include prematurity and low birth weight.

As disturbing as this all sounds, Greeley says the meth problem at Vanderbilt Children’s is not as pronounced as in some other large children’s hospitals in the southeast, or even as pronounced as the problem is in other large city hospitals in the east Tennessee cities of Knoxville and Chattanooga. Proportionally Vanderbilt’s incidence of pediatric meth patients is likely not nearly as prevalent as in some smaller hospitals in rural Tennessee communities being ravaged by the drug.

“During the past year it seems the incidence of the problem has reached a plateau here, at least for now,” he said. “However, it’s too early to call that a trend.”

Meth-Related Burns, Costly Consequences

Jeff Guy, M.D., joined the faculty at VUMC in 1999. His compassion and enthusiasm to give patients his best is always visible, spilling over onto the staff working in the Burn Center. Despite the grim realities and constant challenges of the work they do, many nurses, technicians and therapists are long-term Burn Center employees.

As recently as four years ago Guy and his staff began to see a very slow influx of patients burned, many horribly so, in a brand new way.

And this trickle grew to a steady flood of patients who, in a variety of ways, burn or blow themselves up while manufacturing methamphetamine, or simply while handling its volatile precursor chemicals. This influx of patients has affected Guy and the Burn Center’s staff in ways they could never anticipate.

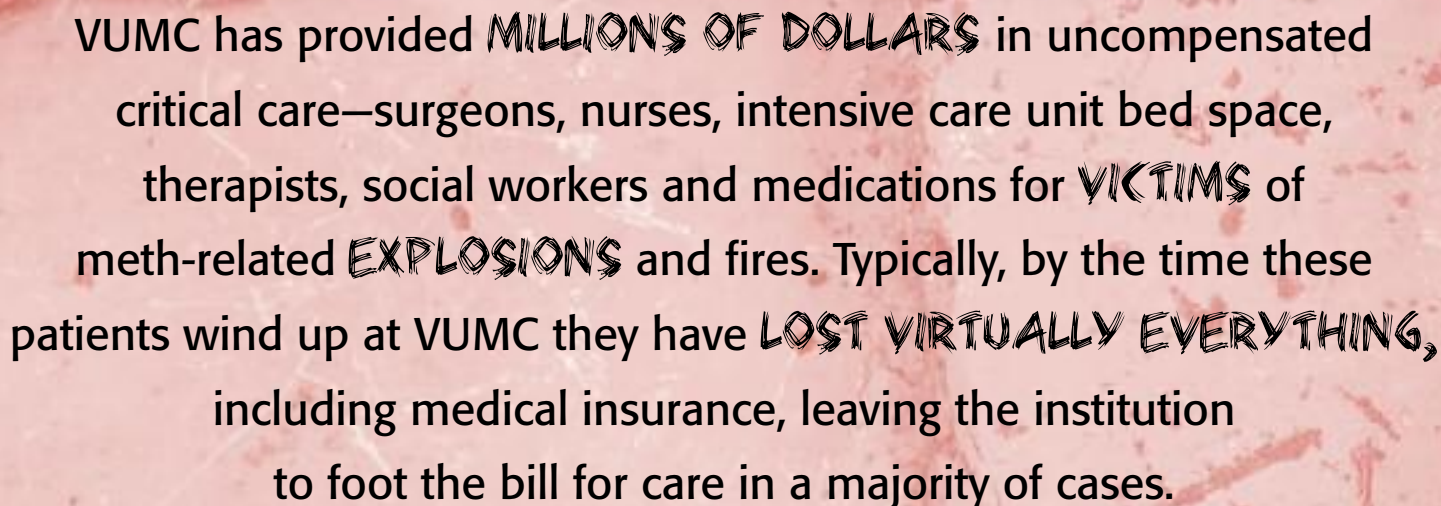
When referring to the ongoing meth crisis, Guy speaks in terms of before and after. Tennessee changed its status of the availability for pharmaceutical products essential to manufacturing methamphetamine—such as cold medicines containing ephedrine—from over-the-counter to behind-the-counter in 2004. Despite this change the patients never stopped arriving. In the last four years Guy says the Burn Center has treated more than 100 patients critically burned in meth-related incidents. In reality that number probably is much higher. Conservative estimates put the cost of care for these patients into the millions of dollars, with much of this expense borne by Vanderbilt.

“Initially, before the cold medicine ban, it got so bad that as many as 25 or 30 percent of our patient census was because of meth. After the state’s Meth Task Force banned the sale of over-the-counter cold medicines, our number of meth-related patients seemed to go down, but now it’s going back up again,” Guy said.

Guy says there is never a day anymore the Burn Center isn’t treating some of these patients, either as inpatients or in the Burn Clinic. He is concerned about the financial impact to the Burn Center for treating uninsured meth-burn victims, and how this financial burden could impact the Burn Center’s long-term mission.

“These people, once they get burned up, can cost the hospital several hundred thousand dollars each. And that’s just the acute care portion,” he said. “Then comes the chronic care portion of treatment. Do they need reconstructive surgery, or ocular surgery? They all need physical rehabilitation therapy and drug counseling.”

This patient population is rife with drug abuse problems



VUMC has provided **MILLIONS OF DOLLARS** in uncompensated critical care—surgeons, nurses, intensive care unit bed space, therapists, social workers and medications for **VICTIMS** of meth-related **EXPLOSIONS** and fires. Typically, by the time these patients wind up at VUMC they have **LOST VIRTUALLY EVERYTHING**, including medical insurance, leaving the institution to foot the bill for care in a majority of cases.



Dan Ramage, licensed clinical social worker, and Jeff Guy, M.D., in the Burn Center.

and high-risk behaviors before being burned. Guy says the lack of community resources to address drug addiction leaves the patients adrift and ready to go back to previous illegal acts.

“When we treat these burns, metaphorically speaking, it’s just like putting a Band-Aid on a gunshot wound,” he said. “It’s because we haven’t fixed the underlying problem that led to this.”

The Burn Center’s patients are typically younger adults, predominantly male, almost exclusively white, and mainly from rural areas in and around Middle Tennessee. A smaller percentage of patients are children, critically burned by being present when their parent’s meth labs explode.

Due to a lack of available burn care beds in surrounding states, patients have come from as far away as Arkansas, Mississippi and Alabama. Virtually none of the patients ever have any form of health insurance. By the time most arrive at the Burn Center the drug has robbed them of every asset they ever owned.

Guy deserves credit for bringing national attention to this specific component of meth’s impact on society—the burden of cost of meth burns on society. In 2004, Judge Seth Norman, who presides over the Nashville Drug Court, brought a deputy director of the Office of National Drug Control Policy (ONDCP) to visit Guy and the Burn Center to see firsthand Vanderbilt’s meth burn victims. The resulting media coverage made Guy a spokesperson for the issue. Since then he’s been

featured in *Newsweek*, on national network TV news, and even in foreign publications such as Germany’s *Stern*, talking about the difficulties and enormous costs associated with the care of these patients.

The Burn Center’s staff has seen it all. One former patient, a 15-year-old girl, arrived at the Burn Center more or less cocooned in melted plastic and burned clothing. She was in a room with large sheets of plastic covering the walls, a frequent tactic among meth cookers to hide the stench of the cooking drug, when an explosion occurred raining down molten plastic covering 85 percent of her body in the process. Thanks to the Burn Center she survived the incident.

“Definitely, from the aspect of impact on the staff, the hardest ones we see are the truly innocent bystanders, the innocent children who are burned in these structure fires from lab explosions,” said Guy. “Or the honest, hard-working, blue-collar guy, like a farmer who suffers a significant chemical burn after someone has tried to steal anhydrous ammonia by tinkering with the regulator on a big tank of his fertilizer.”

Perhaps one of the meth burn patients most exasperating to Guy was a man in his mid-30s, treated at Vanderbilt during late 2004 through early 2005, who wound up in the Burn Center. After receiving the patient, Guy learned this was the man’s second trip to a burn center as a result of a meth lab explosion. The total charges for the uninsured man’s care at Vanderbilt far exceeded \$500,000. This was on top of an

While recipes for making **METH** can vary by ingredients, much like a family's **SECRET RECIPE** for spaghetti sauce, many of the essential and **HIGHLY-TOXIC** base chemicals are the same.



equally large bill Guy later learned the patient racked up at another hospital.

"Each year we treat dozens of patients who appear to have been injured in meth lab explosions. Some patients do not readily, if ever, acknowledge the cause of their burns due to concern there may be a criminal investigation. Some of them are not forthcoming about the true nature of the accident," said Dan Ramage, the licensed clinical social worker assigned to the Burn Center. "Only after we spend some time with them, and perhaps develop some trust through counseling, do some of them disclose what happened."

Ramage, a soft-spoken man with many years as a Vanderbilt social worker helping patients and their families heal the psycho-social aspects of their injuries, has been the Burn Center's primary social worker for the last four years.

"Some of these patients are very ashamed of what happened to them as a result of their drug use, or the way they have been living their lives," he said. "Maybe their drug use led to divorce or to losing their children to foster care. So there is an element of shame with these patients perhaps we don't see in others."

Ramage says that many of the meth burn victims he counsels suffer from poly-substance abuse and are in dire need of substance abuse treatment once they are ready to be discharged from the hospital. Since virtually none of these patients have health insurance, the need for counseling poses a significant problem.

"In addition to their dependence on drugs, these patients are often disfigured as a result of their injuries. So they leave the hospital with an additional set of problems such as body

image issues coupled with related depression and social anxiety," he said.

With the meth burn victim at the problem's center, the damage done by the drug spreads out among the patient's social support system like the pattern of a shattered window—breaking the lives of spouses, children, parents, and anyone else involved who happens to be in its path. "As a result of their accident, many times these people lose absolutely everything," Ramage said.

Ramage recalls a recent patient who is typical of the problem, a young man in his early 20s, who despite his meth use was trying to turn his life around. The man was employed and engaged to be married.

"He tells me he was trying to get off meth, and at the time of his accident was in outpatient counseling," Ramage said. "The young man tells me he had not been able to stop the abuse. In the midst of all this he has the explosion and is now out of a job, his fiancé left him, and he is having to live with his mother so she can care for him. He's become something of an invalid. He has no medical insurance and doesn't have any real way to get into a drug treatment program."

Images of burning buildings probably come naturally to a director of a burn center, and that's what Guy falls back on when he tries to sum up the meth-burn treatment intersection: "If you had a big building on fire in your community someone would do something about it. The local, state or federal government would step in to help," he said. "But here you've got these peoples' lives who are being burned up and nobody seems to be taking responsibility for it but Vanderbilt."

Meth and the body: Lift you up until you break

Methamphetamine, typically in powder or rock form (called ice), can be orally ingested, smoked, snorted or injected. The drug is a powerful stimulant which in a matter of minutes overwhelms the central nervous system producing an intense high. The rush from the drug is caused by the release of high levels of dopamine into the part of the brain that controls pleasure.

"This drug is called the poor man's cocaine, and has a very similar action to cocaine. It gives users a feeling of euphoria, and a real feeling that you can do more while on the drug," Seger said. An overdose of meth causes increased blood pressure, rapid heart rate, and euphoria or perhaps even hallucinations if the dose is high enough. But perhaps the most serious consequence, leading to morbidity and mortality, are these symptoms in concert with a significantly elevated body temperature, perhaps as high as 106 degrees, for a prolonged period.

A 2002 survey from the U.S. Department of Health and Human Services, titled *National Survey on Drug Use and Health*, found that more than 12 million people in

America age 12 and older reported they had used methamphetamine at least once in their lifetime. Of those surveyed, 597,000 people ages 12 and older reported meth use during the past month.

The 2002 survey found that meth use among college students—ages 19 to 28—had declined to 1.2 percent, down from the 3.3 percent reported during 1999's survey.

Long-term meth use typically results in drug tolerance, requiring users to take larger doses to achieve the same effect. Chronic use of meth can lead to psychotic behavior including intense paranoia, visual and auditory hallucinations, and rage-fueled violent episodes. Research has shown that long-term meth use can severely damage dopamine-producing cells in the brain.

"P.E.T. studies have confirmed that chronic use of methamphetamine actually decreases the amount of dopamine transported and therefore the amount of dopamine in your brain," she said. "That's one of the chemicals you need in your brain to feel good."